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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT	PAPER NUMBER
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18

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/297,483

Applicant(s)
Seki et al.

Examiner
Michael Cleveland

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1762



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on Aug 6, 2001

2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 37-54, 56, 58, 62, and 63 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 37-54, 56, 58, 62, and 63 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1 Certified copies of the priority documents have been received.

2 Certified copies of the priority documents have been received in Application No. _____

3 Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)

18) ☐ Interview Summary (PTO-413) Paper No(s) _____

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

19) ☐ Notice of Informal Patent Application (PTO 152)

17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____

20) ☐ Other

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DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/5/01 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jonas et al. (U.S. Patent 6,004,483, hereafter '483).

The Example shows the formation of a polyethylenedioxythiophene (PEDT) dispersion that includes polystyrenesulfonic acid (PSS) in water, a polar solvent. Applicant's disclosure teaches that such a composition may be used as a hole-transporting material. Therefore, the composition is a hole-transporting material in a polar solvent.

'483 does not disclose particular viscosities or surface tensions. However, the Examiner takes Official Notice that factors such as the flowability of an ink and its wetting ability on a surface are well known parameters in coating processes. The flowability and wetting ability are controlled by the viscosity and surface tension of the solution. Therefore, it would have been

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obvious to one of ordinary skill in the art at the time the invention was made to have optimized the viscosity and surface tension for the optimum flow and wetting properties.

4. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jonas et al. (U.S. Patent 5,766,515, hereafter '515).

The Example shows the formation of a polyethylenedioxythiophene dispersion that includes polystyrenesulfonic acid in water, a polar solvent. Such compositions may be used as the transparent electrode (which is usually the anode, or hole-injecting electrode) (col. 3, lines 5-67). Thus, it is hole-transporting.

'515 does not disclose particular viscosities or surface tensions. However, the Examiner takes Official Notice that factors such as the flowability of an ink and its wetting ability on a surface are well known parameters in coating processes. The flowability and wetting ability are controlled by the viscosity and surface tension of the solution. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the viscosity and surface tension for the optimum flow and wetting properties.

5. Claims 37-47, 52-53, 56, 58, 62, and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (U.S. Patent 5,725,407, hereafter '407) in view of Cao '281 and Jonas '515.

Claims 37, 52, 56, and 58: '407 teaches a manufacturing process of an EL device, comprising the steps of forming partitioning members (2) on a substrate having openings corresponding to pixels on a substrate, and filling the opening with an anode material (3) (i.e., a hole injecting and transporting layer).

'407 does not teach that the EL device is an organic device, that the anode is filled from an ink-jet printhead using PEDT and PSS and a solvent and drying the composition.

'407 teaches the use of inorganic phosphors to form the EL device. However, the use of organic electroluminescent material to form similar EL devices is extremely well known in the art. See, for instance, '281 (Abstract). '407 uses an ITO anode formed by sputtering (col. 3, lines 11-

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16). However, other anode materials are very well known in the art. For instance, '281 teaches that polythiophene may be used as the anode instead of ITO (col. 10, lines 16-37). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used organic EL material rather than inorganic phosphors and a polythiophene anode instead of the ITO anode with the expectation of similar results.

'281 does not describe a method of depositing a polythiophene film. '515 teaches that a polythiophene films suitable for deposition as electrodes in EL devices (col. 3, lines 5-67) are formed using compositions including PEDT and PSS and a solvent (Example and claims 1 and 3). '515 teaches that such compositions may be applied by liquid coating methods including printing methods (col. 2, lines 51-57). Although ink-jet printing is not explicitly disclosed, ink-jet printing is a notoriously well-known printing method. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used ink-jet printing to have deposited the polythiophene film in the EL device suggested by '407 and '281 with a reasonable expectation of success. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made that such a method would have simplified the process. The method of '407 indicates that the anode layer is deposited uniformly over the partition walls and then selectively removed from the tops of the partitions in order to isolate the electrodes within each opening. However, ink-jet printing is a well-known method of supplying material to selected locations. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used ink-jet printing to have selectively deposited anode material in each opening in order to have made the process more efficient by eliminating the selective removal step. '515 teaches that the applied film is then dried (col. 2, lines 51-57). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have dried the film after depositing it.

Claims 38-44 and 58: The Examiner takes Official Notice that factors such as the flowability of an ink and its wetting ability on a surface are well known parameters in coating

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processes. The flowability and wetting ability are controlled by the viscosity, surface tension, and contact angle with any dispensing nozzle of the solution. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the viscosity, surface tension, and contact angle with the ink-jet nozzle for the optimum flow and wetting properties. The composition of Example 1 of '515 has a weight percent within Applicant's claimed ranges (about 0.5 %).

Claims 45-47: The solvent may be polar solvents, such as water, or water mixed with lower alcohols, such as ethanol.

Claim 53: Thicknesses of less than 1 micron are taught in '515, col. 3, lines 66-67.

Claims 62-63: The electroluminescent elements form a luminescent screen, and are therefore incorporated in a luminescent display.

6. Claims 48-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu '407 in view of Cao '281 and Jonas '515 and further in view of Taniguchi et al. (U.S. Patent 5,667,572).

'407, '281, and '515 are discussed above. '515 teaches that the solvent for the polythiophene (i.e., an ionic polymer) dispersion (i.e., ink) may be a mixture of water with water-miscible solvents, but none of the references suggest ethoxyethanol or glycerin.

Claims 48-51: '572 teaches the preparation of inks that contain ionic polymers (col. 8, lines 13-32) may be made in mixtures containing water-miscible organic solvents, such as glycerin and ethoxyethanol (col. 7, lines 31-57). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used such water-miscible solvents as ethoxyethanol or glycerin as the solvents mixed with water in the polythiophene inks of '515 with the expectation of similar results.

7. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu '407 in view of Cao '281 and Jonas '515 and further in view of Jonas '483.

'407, '281 and '515 are discussed above but do not explicitly teach surface resistances within Applicant's claimed ranges. However, Jonas '483 indicates that similar polythiophene

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films to Jonas '515 can be printed with surface resistances of 10^{10} to 0.1 ohm/square (col. 4, lines 35-36), which overlaps Applicant's claimed range. The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.

Response to Arguments

8. Applicant's arguments filed 7/5/01 have been fully considered but they are not persuasive. Applicant's arguments regarding the method claims are unconvincing. Applicant's remarks regarding Liu alone are unconvincing because they do not address the combination of references. Applicant argues that the references (specifically Jonas) do not fairly disclose ink-jet printing. The Examiner disagrees. Jonas provides a list of techniques for depositing the coatings (col. 2, lines 51-57). However, Jonas makes it clear that the list is not exhaustive, by the words "by known methods, *for example*," (emphasis examiner's) at line 52, and makes it clear that the list of printing techniques is also not exhaustive, "printing processes *such as* gravure printing, silk screen printing..." (emphasis examiner's). It is the Examiner's position that one of ordinary skill in the art familiar with printing processes such as gravure printing and silk screen printing is also aware of the extremely notoriously well known printing process of ink-jet printing.

Applicant's argument regarding the viscosity and surface tension of the composition are not convincing because the claimed ranges of viscosities and surface tensions are well known as operable in printing methods (see, for instance, the references cited in the office action mailed 2/17/2000, and therefore one of ordinary skill in the art would have expected to have used such viscosities and surface tensions with a reasonable expectation of success.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into

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account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (703)308-2331. The examiner can normally be reached on Monday-Friday from 8:30 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck, can be reached at (703) 308-2333.



Michael Cleveland

August 23, 2001



SHRIVE P. BECK
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700